MESH SIDE SHIELD FOR VEHICLE SUNROOF

BACKGROUND OF THE INVENTION

[0001] This invention relates to a vehicle sunroof side shield which is formed of a mesh material, and which has a shape tailored to accommodate pivotal movement of the sunroof panel.

[0002] Vehicles are often provided with a sunroof. As known, the sunroof has a panel which pivots within an opening in the vehicle roof, from a "closed" position to a "vent" position. The sunroof panel is also capable of moving rearwardly to an "open" position where the roof opening is entirely open. A drive mechanism is received at each lateral extent of the sunroof to drive the panel to pivot, and to retract the panel to its "open" position. "Sunroof" as used in this application includes any panel mounted in a vehicle roof opening, and moveable relative to the opening.

[0003] This drive mechanism includes various moving parts. These moving parts are nominally accessible to occupants of the vehicle interior. There has been concern about the vehicle occupant's being "pinched" by these moving parts should they inadvertently move their hands into the area of the drive mechanism.

[0004] Thus, prior art sunroofs have sometimes included side shields. The side shields block access to the moving parts from the interior of the vehicle. The side shield of the prior art has been a heavy rubber corrugated member with a generally rectangular shape. The rectangular corrugated rubber member is attached to a pivoting bar, which moves with the panel. The pivoting bar pivots the panel between the vent and closed position.

[0005] The corrugated rubber side shields have been somewhat undesirable in that they are unsightly. Moreover, the corrugated rubber blocks airflow into the vehicle cab; defeating the main reason for the "vent position." The rectangular shape of the side shield also includes unnecessary additional material.

SUMMARY OF THE INVENTION

[0006] In a disclosed embodiment of this invention, a sunroof side shield is formed from a mesh material. "Mesh" as utilized in this application is defined as a material wherein a large percentage of its cross-sectional area is open and allows the flow of air. A "mesh" material is typically relatively thin, and less than .1 mm thick. In the most preferred mesh as utilized for this invention, the mesh is .3 mm thick. Moreover, a mesh allows airflow generally across its entire cross-sectional area, through openings between its fibers. That is, something more than a thick, air impermeable material having a few spaced holes. A mesh fabric available from a company called Roekona of Germany is suitable for this purpose. A copy of the material specifications will be included in the file history of this application. However, other mesh materials would be suitable. Also, while a mesh material is most preferred, other fabrics that allow air flow may be utilized within the scope of this invention. That is, either woven or non-woven fabrics that are not impervious to airflow may be utilized within the broader teachings of this invention.

[0007] In another feature of this invention, the side shield could be said to be generally triangular. The shape is not an actual triangle, however, the forward end will be of a length that is much less than the rear end. This shape better matches the upward

pivoted position of the panel in the "vent" position. Thus, in the "closed" position there is less material which must be accommodated.

[0008] The various features and advantages of this invention will become apparent to those skilled in the art from the following detailed description of the currently preferred embodiment. The drawings that accompany the detailed description can be briefly described as follows.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] Figure 1 shows a prior art vehicle.

[0010] Figure 2 shows the prior art side shield.

[0011] Figure 3 shows the inventive side shield in an exploded position.

[0012] Figure 4 shows the inventive side shield removed from a drive mechanism.

[0013] Figure 5 shows the side shield in the "vent" position.

[0014] Figure 6 shows the side shield in the "closed" position.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0015] Figure 1 shows a known vehicle 20 incorporating a sunroof panel 22 having side shields 24. As is known, the sunroof panel 22 pivots to the illustrated "vent" position, and downwardly to a "closed" position. In the "closed position" the sunroof panel 22 seals against an opening 25 in the roof of the vehicle 20. In the vent position, as can be appreciated, air can enter the vehicle through the opening 25, and around the rear of the sunroof panel 22. Side shields 24 are heavy corrugated rubber members which block

flow of air into the vehicle along the sides. The purpose of the "vent" position is to allow the airflow into the vehicle. Thus, the heavy rubber corrugated side shields, which block airflow, have some undesirable characteristics. However, the side shields do prevent occupants of the vehicle from inadvertently having their fingers pinched by the moving parts which drive the sunroof panel 22 between the vent, open and closed position.

[0016] As shown in Figure 2, the side shield 24 has corrugations 26, and a rear end 28 which is approximately of the same length as forward end 30. Top and bottom extents 31 connect the rear end 28 to the forward end 30. The use of the rectangular side shield 24 results in additional unused material, which must be accommodated when the window is in its "closed" position. Further, the use of this heavy rubber member blocks airflow as explained above, and is also somewhat unsightly.

[0017] As further shown in Figure 2, the side shields has a clip member 34 which clips onto a rear pin 36 from a pivoting bar 38. Pivoting bar 38 serves to pivot the sunroof panel 22 between its "vent" and "closed" positions. As is also well known, the sunroof panel 22 can also be moved rearwardly out of the opening 25 to a fully "open" position. The mechanisms and connections for driving the panel 22 between these positions are as known in the art, and form no portion of this invention.

[0018] A follower 40 is driven by a drive mechanism to move the pivot bar 38 and the glass panel, as is known. A slot 42 on the follower 40 receives a pin 44 from a lower frame member 46 of the side shield 24. A forward pin 48 is received in an opening 50 which also moves with the pivoting bar 38. An upper frame 52 carries sockets (not shown) which are received on pins 56 associated with the pivoting bar 38. A rail 58 guides the sunroof panel 22 and the drive mechanism for movement.

[0019] An inventive side shield is shown at 60 in Figure 3. As shown, the surface 62 of the side shield 60 have a mesh construction as shown at 64. In Figures 4-6 the material is shown more closed than in Figure 3. It should be understood this is only to simplify Figures 4-6. "Mesh" as utilized in the context of this application means that much of the cross-sectional area of the surface 62 is open, and allows flow of air. As shown, the rear end 66 has a greater length than the forward end 68. A lower surface 70 is generally straight, while the upper surface 72 extends at an angle to connect the rear end 66 to the forward end 68. While it is clear from this figure that the surface 62 is not actually triangular, it more closely approximates the movement of the sunroof panel 22 to the vent position than does the prior art. In this manner, there is less wasted material which must be accommodated in the various positions of the panel 22 then was the case in the prior art. The side shield 60 may be attached to the pivoting bar 38 and follower 40 in a manner not unlike that of the prior art shown in Figure 2. Notably, the sockets 54 which are not shown in Figure 2 are visible in Figure 3.

[0020] As shown in Figure 4, the drive link 70 which connects the follower 40 to the pivoting bar 38 assists in driving the panel 22 to its "vent position." The cross-sectional shape of surface 62 is closely matched to the distance between the sunroof panel 22 and the rail 58 in the vent position, such that there is little unnecessary material.

[0021] As shown in Figure 5, the side shield 60 has now been attached to the drive mechanism and panel 22 is in the "vent position." As can be appreciated, the cross-sectional shape of surface 62, and in particular the small forward end 68, provides adequate material to prevent inadvertent movement of occupant's fingers into an area where the drive mechanism is located. It should be appreciated that the mesh of the cross-

sectional area of surface 62 allows the flow of air into the vehicle cab in a largely unrestricted way.

[0022] When the window is pivoted to its "closed" position as is shown in Figure 6, there is less material which need be accommodated then was the case in the prior art. In the prior art, due to the rectangular shape of the side shield, it should be appreciated that there was a great deal more unnecessary material at the forward end when the panel is in its "vent" position. All of this additional material needed to be accommodated when the vehicle is in its "closed" position, and that was undesirable.

[0023] It should be appreciated that Figures 2-5 all show the side shields at a laterally inner position relative to the drive mechanisms. That is, an occupant of the vehicle 20 (see Figure 1) who reaches a hand through roof opening 25 will encounter the side shield prior to the drive mechanism. Also, although Figures 2-6 only show a single side shield, a worker in the art will recognize that two side shields will preferably be used, as shown in Figure 1.

[0024] The preferred embodiment of this invention has been disclosed, however, a worker of ordinary skill in the art would recognize that certain modifications would come within the scope of this invention. For that reasons the following claims should be studies to determine the true scope and content of this invention.